FILE COPY FOREST INSECT
UNIVERSITY O
BERKELEY,
~~625.2~~
625.2

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project h-1-22 Date Author

SUBJECT—

# TITLE

FOREST INSECT SURVEY - SIERRA NATIONAL FOREST

SEASON OF 1943

by

G. R. Struble
Berkeley, California
January 29, 1944

INDEX NO.—

U.S. GOVERNMENT PRINTING OFFICE 8—9742

7 copies typed; distribution as follows:

2 - FCC (1 for Mr. Carter)
1 - Forest Supervisor, Sierra
1 - files
1 - G.R.S.
1 - R.O.
1 - Portland, routed thru Lowden

Forest Insect Laboratory
Berkeley, California
January 29, 1944

# FOREST INSECT SURVEY - SIERRA NATIONAL FOREST

## SEASON OF 1943

APPROVED BY:

F. P. Keen
Senior Entomologist, in Charge

SUBMITTED BY:

Geo. B. Staebler
Associate Entomologist

# FOREST INSECT SURVEY - SIERRA NATIONAL FOREST

## SEASON OF 1943

## INTRODUCTION

The forest insect survey of the Sierra National Forest in undertaken annually by the Berkeley, California, laboratory of the Forest Insect Investigations Division, Bureau of Entomology and Plant Quarantine. The purpose of this survey is to obtain information on insect losses in commercial timber, to determine the trend of infestations and to recommend control work where and when necessary. It is done primarily for the benefit of the Forest Service and for information of research value to the forest insect laboratory in determining infestation cycles.

The 1943 survey was undertaken intermittently during the latter part of August and September. Owing to limitations in personnel and travel this year, coverage of the forest was not as detailed as in former years, and hence the loss estimates are more sketchy than normally desirable. Plot surveys were limited to the Chiquito area which contains the largest block of commercial virgin timber on the forest. Elsewhere, with the exception of one road strip plot on Footman Ridge, the loss data were obtained from reconnaissance viewing and counts of faded crowns. The personnel engaged on this survey were J. E. Patterson, P. C. Johnson and G. R. Struble.

## REPORTING AREAS

This report deviates somewhat from the usual system of reporting the insect losses for this forest, particularly with respect to reporting units. Because of the changing status of timbered areas from commercial virgin to cutover stands, and the special consideration of recreational areas, we feel that our modified reporting units will fit more logically into the management plans for these areas. The reporting areas are shown by Table 1 and are designated by number on the map accompanying this report.

A summary of the acreage and stocking of the most valuable commercial pine stands left on the forest is shown by Table 2. The volume figures were taken from the management policy statement for the Sierra National Forest 1/ and are subject to revision pending the completion of resurveys made during 1943.

---

1/ Timber Management Policy Statement - Sierra N. F., January, 1939.

Table 1. Entomological Reporting Units - Sierra National Forest.

| Management Status | Area | Entomological Unit Number | Name | Acreage |
|---|---|---|---|---|
| | | VIRGIN PINE TIMBER | | |
| Primary Commercial | Willow Creek | 12 | Cascadel | 6,400 |
| | | 11 | Rock Creek | 10,500 |
| | Kings River | 19 | Blue Canyon | 14,060 |
| | | 20 | Dinkey Mt. | 8,320 |
| | | 21 | Oak Flat | 10,240 |
| | Chiquito | 13 | Chiquito | 48,000 |
| | Kaiser | 14 | Daulton | 22,550 |
| | | 15 | Canyon | 3,840 |
| Secondary Commercial | Kings River | 22 | Patterson Mt. | 23,680 |
| | Chowchilla | 5 | Miami | 7,200 |
| | | 2 | Footman Ridge | 3,800 |
| | | 1 | Jerseydale | 7,600 |
| Recreation | Willow Creek | 7 | Bass Lake | 17,920 |
| | | CUTOVER TIMBER | | |
| | Shaver | 16 | Shaver Lake | 21,000 |
| Light or Moderate Cut | Willow Creek | 6 | Soquel | 14,080 |
| | | 8 | Chilcoot | 5,760 |
| | | 10 | Whiskey Ridge | 14,080 |
| | Chowchilla | 5 | Miami | 12,160 |
| | Wawona | 3 | Signal Ridge | 7,040 |
| | Shaver | 17 | Jose Basin | 12,800 |
| | | 18 | Pine Ridge | 11,520 |
| Clear Cut | Willow Creek | 9 | Sand Creek | 16,000 |
| | Wawona | 4 | Fish Camp | 13,440 |

Table 2. Acreage and Volumes of Commercial Virgin Pine Areas. *

| Working Circle | Acres | Volume B. M. | | | |
|---|---|---|---|---|---|
| | | Ponderosa Pine | Sugar Pine | Other Species | Total |
| Willow Creek | 16,902 | 223,592,000 | 102,104,000 | 113,316,000 | 439,012,000 |
| Chiquito | 48,753 | 682,677,000 | 335,364,000 | 557,245,000 | 1,575,286,000 |
| Dinkey Mt. | 32,620 | 430,440,000 | 289,878,000 | 447,688,000 | 1,168,006,000 |
| Kaiser Ridge | 26,391 | 393,616,000 | 164,630,000 | 56,462,000 | 825,923,000 |
| Patterson Mt. | 23,680 | 142,351,000 | 167,539,000 | 413,101,000 | 723,035,000 |
| Total | 148,346 | 1,872,676,000 | 1,059,515,000 | 1,587,889,000 | 4,731,262,000 |

* Approximately 93% of land area and 89% of timber volume government owned.

Considered from the insect hazard standpoint, the commercial virgin pine areas are primary in demanding the attention that should be given them, because of the large number of mature and overmature trees which are more susceptible to attack. The values represented, particularly on the areas of high commercial value, demand that undue losses by insects be prevented if possible. The areas of secondary commercial value comprise roughly about 100,000 acres, with timber volumes (mainly ponderosa pine) aggregating approximately 500,000,000 board feet.

Cutover areas comprise approximately 150,000 acres, some of which are again approaching virgin stocking conditions. The Soquel unit contains the best second growth pine stand on the forest, and is the most important from the insect hazard standpoint. This is an area of approximately 14,000 acres of Site II second growth sugar pine-fir-ponderosa pine type which was cut about 1880.

## RESULTS OF THE SURVEY

### Character of the Infestation.

Insect conditions generally over the forest have been sustained at low endemic status. No aggressive attacks were found, except in the immediate vicinity of the Herr Ranch burn along Lewis Creek in the Miami unit where a localized infestation in fire-injured trees was evident. This hazard has been greatly reduced, however, owing to the logging of fire-injured trees by nearby local mills. A slight increase of insect activity in ponderosa pine and Jeffrey pine along the south slopes lying immediately north of the town of Big Creek was observed by Johnson. The infestation as a whole in 1943 at the time of the survey was somewhat less than in 1942. The 1943 survey is only about 75 percent complete, because of attacks that generally occur later in the fall.

Except in the burned area, infestations in ponderosa pine this year were confined to individual trees at widely scattered intervals. Generally, the trees selected for attacks were mature or over-mature with moderately vigorous to decadent crowns.

Sugar pines infested with the mountain pine beetle occurred in about the same number as they did in 1942. There was a slight decrease on certain of the cutover areas and increases in others; the average number of infested trees is estimated between 1 and 3 trees per section. In mixed virgin stands, the estimated number of infested sugar pines is between 2 and 4 per section.

Loss estimate summaries for the Sierra National Forest during the three-year period from 1941 to 1943 are shown in Tables 3 to 8, incl. Tables 3 and 4 include measured losses from plots established in the Chiquito unit and they serve as a strong basis for estimates of loss in the entire Chiquito area. Tables 5 to 8, inclusive, are estimates based primarily on reconnaissance counts of faded trees occurring in the areas examined.

Measured Pine Losses.

The Chiquito unit contains the only plots in virgin pine stands of major importance covered in 1943 by a 100 percent cruise. Comparative pine loss data by species for the three-year period from 1941 to 1943, inclusive, on three road strip plots in this area are shown by Table 3. Table 4 presents the comparative losses in ponderosa pine, sugar pine, and Jeffrey pine on plot RS-9 (320 acres).

Table 3. Measured pine Losses on Chiquito Road Strips.

| Sample Strip | Timb'd Acreage | Volume per acre in board feet | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Ponderosa pine | | | Sugar pine | | | Jeffrey pine | | |
| | | 1941 | 1942 | 1943 | 1941 | 1942 | 1943 | 1941 | 1942 | 1943 |
| RD-1 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RD-2 | 120 | 36 | 12 | 22 | 0 | 37 | 0 | 0 | 39 | 0 |
| RD-3 | 32 | 5 | 79 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 4. Measured Pine Losses, 1939 to 1943 - Jackass Plot (RS-9): 320 Acres

| Tree Species | Year of Loss | No. Trees | Volume BM | Volume BM per Ac. |
|---|---|---|---|---|
| Ponderosa pine | 1939 | 27 | 15,680 | 49 |
| | 1940 | 4 | 10,340 | 32 |
| | 1941 | 6 | 6,510 | 20 |
| | 1942 | 14 | 15,340 | 50 |
| | 1943 | 5 | 6,890 | 22 |
| | Total | 56 | 44,760 | 173 |
| Sugar pine | 1939 | 10 | 17,410 | 55 |
| | 1940 | 2 | 10,610 | 33 |
| | 1941 | 0 | | |
| | 1942 | 4 | 200 | 0.6 |
| | 1943 | 1 | 1,240 | 4 |
| | Total | 17 | 29,460 | 92 |
| Jeffrey pine | 1939 | 1 | 800 | 3 |
| | 1940 | 2 | 3,110 | 10 |
| | 1941 | 0 | | |
| | 1942 | 0 | | |
| | 1943 | 0 | | |
| | Total | 3 | 3,910 | 92 |

Estimated pine losses - 1941 to 1943.

1. Commercial virgin pine areas.

Table 5. Estimated losses on Areas of high commercial value.

| AREA | Unit | Acreage | 1941 Trees | 1941 MBM | 1941 BM/Ac | 1942 Trees | 1942 MBM | 1942 BM/Ac | 1943 Trees | 1943 MBM | 1943 BM/Ac |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Willow Cr. | Cascadel | 6,400 | 45 | 31 | 4.8 | 19 | 15 | 2.3 | 27 | 23 | 3.6 |
| | Rock Cr. | 10,500 | 75 | 51 | 4.9 | 31 | 25 | 2.4 | 43 | 37 | 3.0 |
| Kings Rv. | Blue Can. | 14,060 | 116 | 68 | 4.8 | 47 | 28 | 2.0 | 66 | 56 | 4.0 |
| | Dinkey | 8,320 | 69 | 40 | 4.8 | 28 | 17 | 2.0 | 39 | 33 | 4.0 |
| | Oak Flat | 10,240 | 85 | 49 | 4.8 | 35 | 21 | 2.0 | 48 | 41 | 4.0 |
| Chiquito | Chiquito | 48,753 | 850 | 582 | 11.9 | 350 | 360 | 7.4 | 225 | 135 | 2.7 |
| Kaiser | Daulton & Canyon | 26,391 | 820 | 396 | 15.0 | 410 | 220 | 8.3 | 200 | 120 | 4.5 |
| | Total | 124,666 | 2,060 | 1,217 | 9.2 | 920 | 686 | 5.0 | 648 | 445 | 3.6 |

Table 6. Estimated losses on Areas of secondary commercial value.

| AREA | Unit | Acreage | 1941 Trees | 1941 MBM | 1941 BM/Ac | 1942 Trees | 1942 MBM | 1942 BM/Ac | 1943 Trees | 1943 MBM | 1943 BM/Ac |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kings Rv. | Patterson Mtn. | 23,680 | 150 | 100 | 4.2 | 90 | 72 | 3.0 | 70 | 56 | 2.4 |
| Chowchilla | Miami | 7,200 | 20 | 8 | 1.8 | 10 | 5 | 1.1 | 160 | 60 | 8.3 |
| | Footman Rg. | 3,800 | 65 | 52 | 13.6 | 60 | 50 | 13.1 | 50 | 35 | 9.2 |
| | Jerseydale | 7,600 | 70 | 30 | 3.9 | 60 | 25 | 3.3 | 54 | 22 | 2.9 |
| | Total | 42,280 | 305 | 190 | 5.7 | 220 | 152 | 5.1 | 334 | 173 | 5.7 |

2. Recreational Areas.

The Bass Lake and Shaver Lake units are the only recreational areas within the commercial pine timber zone on the forest. The timber surrounding Bass Lake is within the virgin timber zone of secondary commercial importance. The Shaver Lake area is cutover with the exception of about 3,000 acres lying to the west and north of Shaver Lake. Because of their special use for recreational purposes, the reporting and control of insect infestations on these two areas are considered separately. Estimates of losses to these areas are shown by Table 7.

Table 7. Estimated pine losses on recreational areas.

| AREA | Unit | Acreage | 1941 Trees | 1941 MBM | 1941 BM/Ac | 1942 Trees | 1942 MBM | 1942 BM/Ac | 1943 Trees | 1943 MBM | 1943 BM/Ac |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Willow Cr. | Bass Lake | 5,700 | 40 | 16 | 2.8 | 30 | 15 | 2.6 | 40 | 12 | 2.1 |
| Shaver | Shaver Lk. | 6,400 | 260 | 200 | 31.2 | 20 | 14 | 2.2 | 60 | 30 | 4.7 * |
| | Total | 12,100 | 300 | 216 | 17.0 | 50 | 29 | 2.4 | 100 | 42 | 3.4 |

* An aggressive localized infestation by the mountain pine beetle developed in sugar pine stands of the Shaver Lake unit during 1940. Direct control of the infestation was instituted by the Forest Service in the spring of 1941, and maintenance work was again undertaken in the spring of 1942. By the fall of 1942 infestations had decreased and have since remained in low endemic status.

3. Cutover Areas.

Generally, the insect hazard in second growth pine areas is very much less than within virgin timber, and consequently there is little need for intensive coverage by insect surveys. The Soquel, Chilcoot Creek and Signal Peak units are the most important because of the large number of reserve sugar pines, some of which are killed each year by the mountain pine beetle. Comparative loss estimates for some of the principal cutover areas on the forest are shown by Table 8.

Table 8. Estimated pine losses on cutover areas.

| AREA | Unit | Acreage | 1941 | | | 1942 | | | 1943 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees | MBM | BM/Ac | Trees | MBM | BM/Ac | Trees | MBM | BM/Ac |
| Willow Cr. | Soquel | 3,800 | 80 | 68 | 17.9 | 35 | 30 | 7.9 | 20 | 25 | 6.6 |
| | Chilcoot Cr. | 6,200 | 30 | 20 | 3.2 | 15 | 10 | 1.6 | 25 | 15 | 2.6 |
| | Whiskey Rg. | 6,400 | 50 | 30 | 4.7 | 40 | 25 | 3.9 | 20 | 15 | 2.3 |
| Chowchilla | Signal Rg. | 3,200 | 20 | 30 | 9.4 | 15 | 22 | 6.9 | 10 | 7 | 2.2 |
| Shaver | Jose Basin | 3,800 | 40 | 10 | 2.6 | 10 | 3 | .8 | 12 | 20 | 5.3 |
| | Total | 23,400 | 220 | 158 | 7.5 | 115 | 90 | 4.2 | 87 | 92 | 4.0 |

Trend of Infestations.

The infestation trend for the past three years has been generally downward. Very low endemic conditions prevailed throughout the forest as a whole in 1943. In some local areas there was a slight advance in infestation over the previous year, but not of an extent to justify special attention. The increase in number of infested trees in the Lewis Creek area, for example, was confined to fire-injured trees of the Herr Ranch burn and is not regarded as a serious condition. Slight increases in infestation within virgin pine stands were evident in the Willow Creek and Kings River areas, but even these losses are so low that they can be regarded as of little consequence. An upward trend was indicated also in the Big Creek area. Activity on burned areas - the Canyon burn and Harris Ranch burn - was nearly non-existant in 1943.

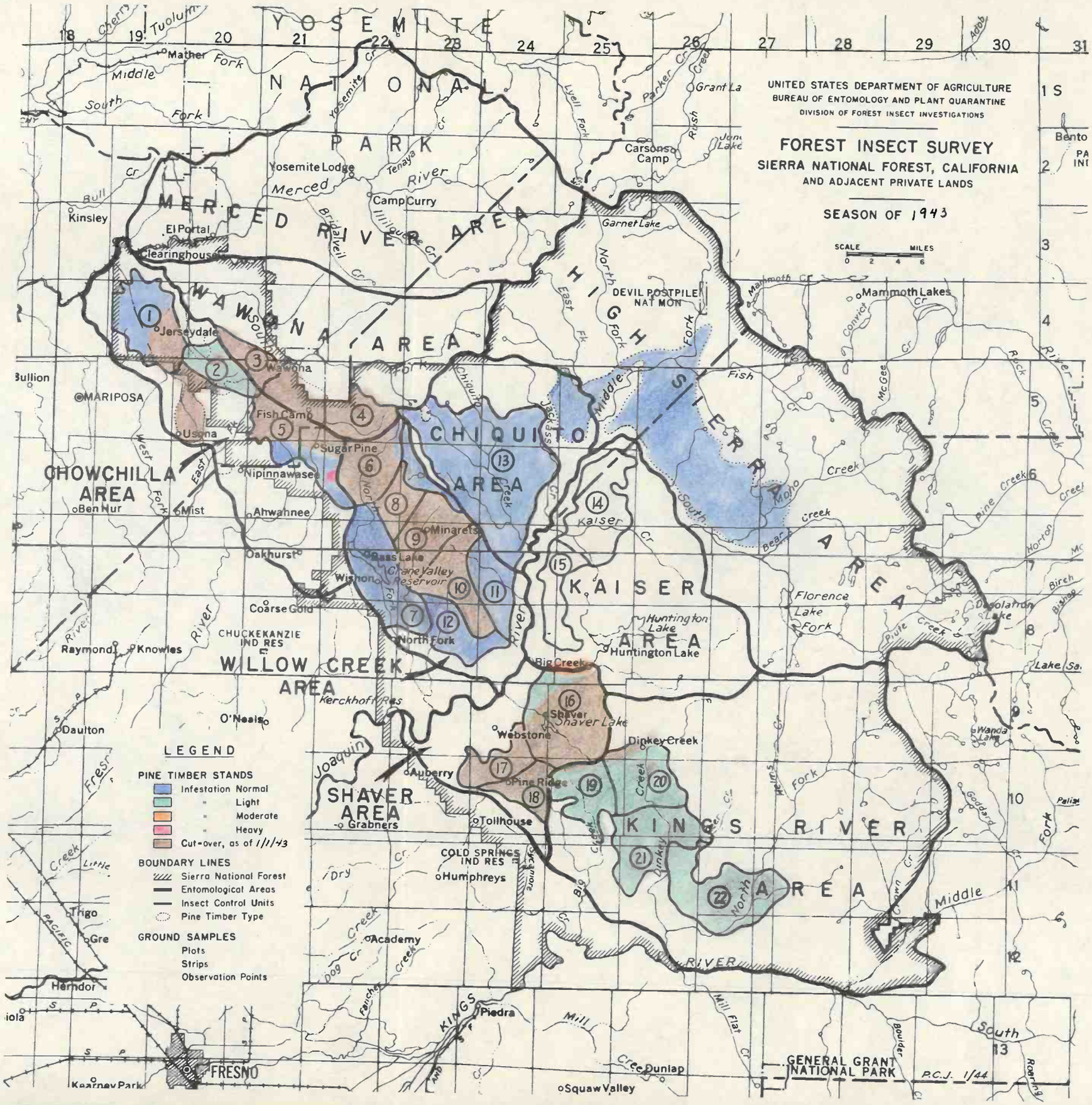
## RECOMMENDATIONS

The present low endemic status of beetle infestations on commercial pine areas does not warrant the necessity for direct control. Current increases in activity on the Herr Ranch burn are expected to die out within the next two years, or soon after the most severely fire-injured trees have been killed.

While no control work is recommended for any of the commercial pine areas of the Sierra National Forest, there are a few which should be kept under observation for any rise in insect infestations. Areas now being logged should be watched because of the attraction that freshly cut timber has for certain of the bark beetles and the possibility of these insects breeding in cull logs or slash. The virgin pine stands of the Willow Creek and Kings River areas which are in this category should be watched closely for any increase in activity.

The continuance of maintenance control of infestations on the Bass Lake recreational area is desirable, even though there are only a few trees to treat. While some of the loss in this area is due primarily to the flooding of the roots of trees growing along the lake shore, these trees support active infestations of the western pine beetle which act as a threat to surrounding timber of high recreational value. They should be eliminated along with other trees killed outright by the beetle, by felling and burning during the winter and spring months.

The Shaver Lake recreational area is now nearly free from insect activity, except in the vicinity of Big Creek. The number of infested ponderosa pines and Jeffrey pines on the slopes lying to the north and west of Big Creek was somewhat greater in 1943 than in 1942. This locality should be observed closely for signs of increased activity, but no control work is immediately necessary.


UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
DIVISION OF FOREST INSECT INVESTIGATIONS
FOREST INSECT SURVEY
SIERRA NATIONAL FOREST, CALIFORNIA
AND ADJACENT PRIVATE LANDS
SEASON OF 1943
SCALE MILES
0 2 4 6
YOSEMITE NATIONAL PARK
MERCED RIVER AREA
WAWONA AREA
CHIQUITO AREA
CHOWCHILLA AREA
HIGH SIERRA AREA
KAISER AREA
WILLOW CREEK AREA
SHAVER AREA
KINGS RIVER AREA
CHUCKEKANZIE IND RES
COLD SPRINGS IND RES
GENERAL GRANT NATIONAL PARK
LEGEND
PINE TIMBER STANDS
Infestation Normal
Light
Moderate
Heavy
Cut-over, as of 1/1/43
BOUNDARY LINES
Sierra National Forest
Entomological Areas
Insect Control Units
Pine Timber Type
GROUND SAMPLES
Plots
Strips
Observation Points
Mariposa
Jerseydale
Wawona
Fish Camp
Usona
Sugar Pine
Nipinnawasee
Ben Hur
Mist
Ahwahnee
Oakhurst
Minarets
Bass Lake
Chane Valley Reservoir
Wishon
Coarse Gold
North Fork
Raymond
Knowles
Auberry
Pine Ridge
Webstone
Shaver
Shaver Lake
Dinkey Creek
Tollhouse
Grabners
Humphreys
Academy
Piedra
Dunlap
Squaw Valley
Huntington Lake
Florence Lake
Bir Creek
Kerckhoff Res
Fresno
Kearney Park
Yosemite Lodge
Camp Curry
El Portal
Clearinghouse
Kinsley
Bullion
Mather
Carsons Camp
Garnet Lake
Devil Postpile Nat Mon
Mammoth Lakes
Daulton
O'Neals
Trigo
Gre
Herndor
Piedra
Bento
P.C.J. 1/44